

Microscopic Evaluation of Friction Plug Welds– Correlation to a Processing Analysis

Ellen M. Rabenberg¹, Poshou Chen² and Sridhar Gorti¹

¹National Aeronautics and Space Administration, Huntsville, AL 35812

²Jacobs, NASA/MSFC, Huntsville, AL 35812

Recently an analysis of dynamic forge load data from the friction plug weld (FPW) process and the corresponding tensile test results showed that good plug welds fit well within an analytically determined processing parameter box. There were, however, some outliers that compromised the predictions. Here the microstructure of the plug weld material is presented in view of the load analysis with the intent of further understanding the FPW process and how it is affected by the grain structure and subsequent mechanical properties.